

## **Panasonic Projectors**

### **Edge blending notes. – (example: PT-D6K Series).**

The following describes the setup of a simple edge-blend application using two single-chip projectors mounted side-by-side with the same signal source applied to each. (The concept is that two lower resolution projectors (e.g. 1280 x 800) are combined to enable the display of a higher resolution source (2432 x 800) without scaling).

1. Set the projectors side-by-side, aligning them so that they are level and as square as possible with respect to each other and the screen. (In aeronautic terms, adjust the pitch, roll and yaw). Select the Grid pattern by pressing Test Pattern on the remote and pressing the left arrow key.

2. Align projector's grid patterns so they are side-by-side. (Center the lenses by holding down the Shift key until the Home option appears onscreen). You can then shift the images as needed

4. Set the zoom positions on the projectors to match. Start with the smallest image possible (this keeps the image edges away from the periphery of the lenses). Focus as necessary.

(Wide zoom setting produces the brightest picture. If you can position the projectors closer to the screen, and set the zoom to the Wide setting too obtain the desired picture size, the final image will be brightest)

2. Check each projector's menu settings page by page, and set all items to the same mode. Use two wired remotes for ease & speed. Press the Default key to reset the values as they are highlighted.

5. Project images and test patterns side by side, and evaluate picture quality – compare overall brightness, color temperature, black-levels, colorimetry etc. Lamp hours should be similar. If the projectors don't match too well, making the final edge blend look good will be difficult.

6. Using the grid pattern, evaluate (or measure) each projected image for "squareness". (If the front face of the projector is not parallel to the projection screen, keystone distortion will become apparent).

7. For best linearity in the blended area, shift the left projector's image to the far left and right projector's image to the far right. This projects the image edges that will be blended through the center of the lens where there is the least optical distortion. (Try to avoid using short-throw lenses because of possible chromatic aberration and image distortion near the lens periphery. However, remember that the viewing circumstances will dictate what is acceptable).

8. Calculate the amount of overlap that will be used. (10 ~ 15% or so of the image width is recommended - this works out to be 4 ~ 6 boxes of the grid pattern, depending on the horizontal pixel count of the projectors. Each grid box is 32 pixels by 32 pixels, so 128 pixels equals 4 boxes, 160 pixels equals 5 boxes, 192 pixels equals 6 boxes, etc. The number of pixels chosen for optical overlap will also be entered in the “Width” setting on the Edge Blend page).

9. Adjust the zoom, and V & H lens-shift settings to overlay the grids exactly by the number of pixels chosen. Reposition the projectors as necessary to eliminate any keystoneing.

The grid lines should be perfectly overlapped, producing a widescreen pattern with a set of brighter boxes in the overlap area.

10. Input a signal of the appropriate format. This will activate the Sub-memory Save capability, which will be used to backup the projector’s state with the edge-blend settings. (Assign the Sub Memory function to the FUNC1 key).

11. Select the White test pattern. If the white areas to the left and right of the brighter overlapped area differ in either brightness or color temperature, one or both projectors should be adjusted appropriately. (You can use the “White Gain”, “Color Temperature/User White Balance High” and or “Color Matching – Measure/Target” menus to do this). Confirm and adjust the primary and secondary colors as well.

12. Turn each projector’s Edge Blending ON (in the Advanced menu). Press Enter to access the now-active submenu.

13. On the left projector, turn the Right Start/Width ON, and on the right projector turn the Left Start/Width ON. The overlapped edges will now be feathered.

(The Start and Width numbers on the Edge Blend page are set by default to 0 and 128. This 128 corresponds to 4x32, or 4 boxes of 32 pixels of the grid pattern. If the physical/optical overlap was made greater, this number should be changed accordingly). Gamma should be set to 2.2).

14. Turn the markers ON. The green and red markers from each projector will overlap to produce two yellow markers. (If this doesn’t happen, the Width setting isn’t correct – the Width number should match the number-of-boxes-overlapped times 32)

15. Select the Black Background/White window test pattern. The black area should look uniform and be lighter gray in the overlap area. Turn the markers off.

#### **(Right projector)**

16. Turn the Right Projector’s markers on. You’ll see green and red vertical lines appear just inside the brighter overlapped area.

17. Select Bright Adjust / Bright Inside. Leave it in Interlocked mode. Raise the “White” value up to about 50. You'll notice the black level increasing, starting at the red marker that lies just within the overlap area

18. MENU back up to the Bright Adjust menu and adjust the LEFT value - you'll see what looks like a wipe pattern moving to the right, starting from the red marker. Move the position of this “wipe-edge” to the right until it aligns with the edge of the overlap area, which is about five to 10 pixels to the right of the red marker.

19. Go back to the Bright Inside Interlocked screen and lower the white value until the black level in the main picture area matches the black level in the overlapped area. Turning off the markers makes it easier to see when this is achieved. If there's a noticeable difference in the color temperature in the black picture area, you can unlock the RGB values and adjust them individually to match the black level color temperature.

20. The Bright Outside values are usually not used, and are set to zero. (Older model projectors sometimes required this adjustment).

#### **(Left projector)**

21. Repeat the same procedure, but use the Bright Adjust RIGHT value for the wipe edge.

#### **Electronic (Shift) Alignment of the images**

Now that the grids are physically aligned, and the brightness levels across the blend area are matched, the source images can be electronically shifted for proper overlap.

22. Select the appropriate inputs to display the images or video to be presented. You should see two images side-by-side.

23. Check the Advanced menu Blanking settings to make sure they're all set to zero. Check the Position /Shift menu to make sure all values are set to the defaults. Adjust the Position/Aspect and Position/Zoom settings to frame the images appropriately.

#### **Right projector**

24. Use Position/Shift/H to shift the image inwards towards the overlap blended area.

#### **Left projector**

25. Use Position/Shift/H to shift the image inwards toward the overlap blended area. Overlap the images exactly.

26. Use Advanced/Blanking to mask any wrapped-around image that appears on the left or right of each projector respectively.

27. Once the images are overlapped properly, save the projector's current setup state in a sub memory with the FUNC1 key. (Rename the sub memory entry if this option is available)

### **Further steps**

28. With actual picture material you might tweak the left and right edge-blending widths, as well as brightness and contrast a bit to make up for the raised black level.

29. Note that the blend quality is image dependant – appropriate material should be chosen to show the blend to best effect.

### **(Image-related calculations)**

30. Calculate the total image size, which will be twice the horizontal width of each projector, minus the overlap, times the vertical height.

(For example, 1024 pixels from each projector x 2 = 2048 horizontal pixels total. Subtract the 128-pixel overlap (which is the default 4 boxes of 32 pixels each on the grid) to get 1920 horizontal pixels. If the projectors are 768 pixels high, an image of 1920 by 768 pixels can be projected).

Note that the projectors will lock to a maximum input resolution of 1920 x 1080. In this example, a 1920 x 768 image should be framed within a 1920 x 1080 raster, so the projectors will display the 768 lines of active picture, while the extra 312 lines of unused raster will be masked (fall off-screen)

Choose the appropriate signal source.

- a). A computer's VGA output can be distributed through a VGA splitter.
- b). Dual head cards (either VGA or DVI) with image splitting or cloning utilities.
- c). Hard drive players with DVI out (at 1920 x 1080 max), which can be distributed through a DVI splitter.

### **Calculating the final screen size**

### **Projector placement**